

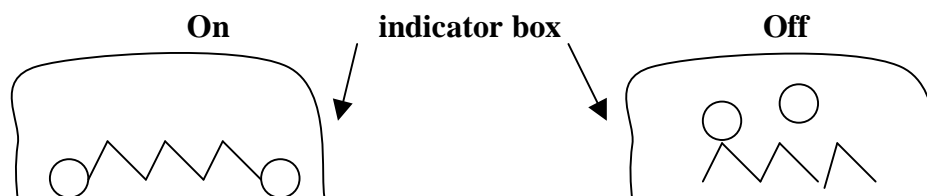
## Shipping of the HXTU: measurements of accelerations with impact indicators

[http://tspc01.fnal.gov/darve/heat\\_exchanger/accelerometers.html](http://tspc01.fnal.gov/darve/heat_exchanger/accelerometers.html)

**Goal:** In order to estimate the accelerations seen by the HXTU modules during their shipping, we need to register the status of the impact indicators (accelerometers) installed at Fermilab, once the crates just arrived at CERN.

The impact indicator is composed of 2 independent and perpendicular layers (front and back) of bulls and spring. The 2 assemblies are set in equilibrium in the indicator box, according to their calibrated acceleration.

*Status for one layer:*



### 1. Instrumentation:

- 1.1. A three-axis accelerometer: Impact recorder (life time 10 days; chart speed metric: 7.62 cm/hour)
- 1.2. 10 non-resettable impact indicators - 10g.
- 1.3. 10 non-resettable impact indicators - 5g.
- 1.4. 5 resettable impact indicators - 2g; 4g, 6g, 8g, 10g.

### 2. Enclosed materials:

- 2.1. Drawing "Location of the accelerometers".
- 2.2. Worksheet: "Impact indicators - Status".
- 2.3. A carton with the reexpedition name for the return of the impact recorder referred 1.
- 2.4. 20 plastic plugs (Keepers) to be used in order to deactivate the non-resettable impact indicators.
- 2.5. Specification for the impact recorder.
- 2.6. Specification for the resettable impact indicators.
- 2.7. Specification for the non-resettable impact indicators.

## Directives

At the reception of the each modules (USLHC\_001, USLHC\_002, USLHC\_003, USLHC\_004, USLHC\_005, USLHC\_006) the impact recorders have to be controlled and removed.

- 1- Localization of the 26 impact indicators (see dwg 2.1). Names are written on crates to make it easier. Please write the name on the indicator itself if it is not done.
- 2- Control the status of the indicator and fill the table (see worksheet 2.2 ).
- 3- Remove the indicators and install keepers on each non-resettable impact indicators (see 2.4).
- 4- Once the USLHC\_001 is out of the crate, remove Impact recorder #1 from the inside-bottom of the crate, in order to send it back to Fermilab (see 2.3) in march.